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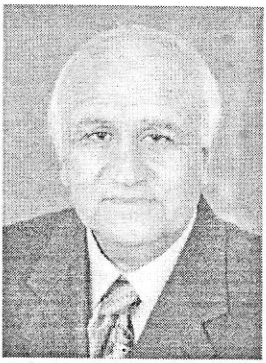

Invited Talk

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EMPLOYMENT

1969-1975... Assistant, Geology Department, Faculty of Science, Assiut University
1975-1976... Assistant Lecturer, Geology Department, Faculty of Science, Assiut University
1976-1981... Ph D. Candidate, Heidelberg University, West Germany
1981-1986... Lecturer, Geology Department, Cairo University
1986-1993... Associate Professor (Ore Deposits), Geology Department, Cairo University
1993-Present ..Professor of Ore Geology (Ore in Sediments), Geology Department, Cairo University
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Egyptian Karst Morphology and Processes, Its Economic Potentiality and Environmental Impacts

Karst is internationally used term, originally the German from the Slavic word "kras" or "krs" meaning a bleak waterless place. The term describes a terrain generally underlain by limestone or dolomite, in which the topography is chiefly formed by the dissolving of rock, and which may be characterized by sinkholes, sinking streams, closed depressions, subterranean drainage and caves. In the temperate and tropical areas, where carbonate rocks are exposed, environmental water may combine with CO_2 in the atmosphere or in the vegetation cover above the rock to produce a weak solution of carbonic acid (H_2CO_3) which slowly dissolves the carbonate rocks.

The Egyptian Phanerozoic carbonate successions are punctuated and truncated by several paleokarst (unconformity) surfaces of local or regional magnitudes. The drowned (fossilized or buried) paleokarst surfaces include: a) Depositional paleokarst surfaces terminating meter scale shoaling cycles, generally with topographic relief of centimeters to decimeters. The effects of exposures are usually restricted to surface solution sculptures, near surface cementation and minor subsurface dissolution, and

b) Drowned paleokarst surfaces representing breaks in sedimentation during periods of relatively long-lived exposure and sea level fall as well as intensive karstification inducing lateritization and pedogenesis along paleohighs of regional or local scales. The associated karst features include widened karren, sinkholes, small scale dolines, collapse breccia, subsurface solution channels and caves together with residual soil products. Different types of enriched ore deposits are genetically related to paleokarstification and developed along paleokarst surfaces as they constitute substnaial horizons of the paleokarst system and the resulted paleokarst profile. Among these karst-related deposits are:

1. Stratabound Carboniferous Mn deposits with Cu and U sulphates, phosphates, vanadates and carbonates, Cu chlorides, gibbsite, kaolinite and alunite, Um Bogma region, Sinai.
2. Stratabound Eocene Fe and Ba deposits, El Bahariya Depression, Western Desert.
3. Stratabound Miocene (post-Miocene ?) Pb, Zn, Sr and Ba deposits, Red Sea coastal zone, and
4. Karst calcareous deposits ("Egyptian Alabaster") mixed with terra rossa sediments and formed at the expense of different carbonate sequences along different paleoerosion surfaces.

The exposed Phanerozoic carbonates also show enormously varied surface and subsurface solution forms associated with surficial duricrusts and paleosols as a result of uplifting and long exposure. The resulted karst landforms are: a) Mature and degraded conekarst, b) Mature and degraded towerkarst, and c) flat-topped tablelands. Solution depressions of variable dimensions (sinkholes, dolines and poljes) and morphogenetic karren forms are widely distributed in the plain surfaces. Farafra depression is one of large poljes, formed by the coalescence of solution dolines and degradation of twerkarst system. Partially to completely filled small and large-scale subsurface cavern levels, potholes and channels are commonly developed along vertical joints and bedding planes.

The analyses of these features and the associated sediments indicate multi-cycles of karstification involving continuous lowering of the landscape. Paleotopography, paleoclimate, soilification, lithology of the host rocks and the tectonic evolution and related structural elements, are the main fundamental factors that controlled the formation, distribution and evolution of the karst landforms and the composition and textures of the associated karst products.

The environmental impacts of karst are either positive or negative. Among the positive impacts are: a) The beautiful landscape and natural surface and subsurface features, b) The economic potentiality of the karst products and precipitates, and c) The karst features and sediments are good indications of the paleoclimate, paleotopography and paleogeographic distribution of the paleohighs and the paleoshorelines. Among the negative impacts of karst are: a) Contamination of the groundwater, b) Household waste problems, c) Flooding, and d) Engineering problems (sinkhole collapse).

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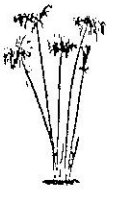

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